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GREAT LAKES
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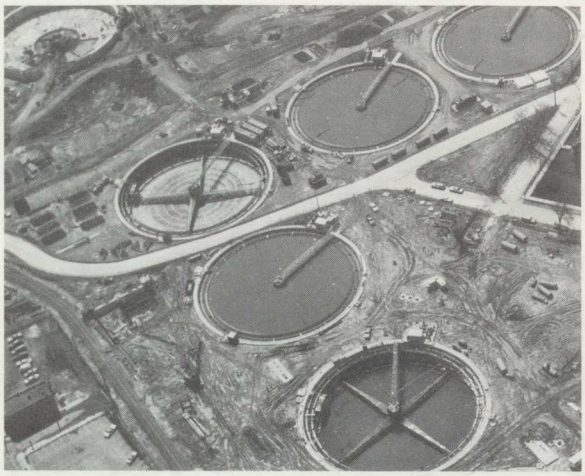
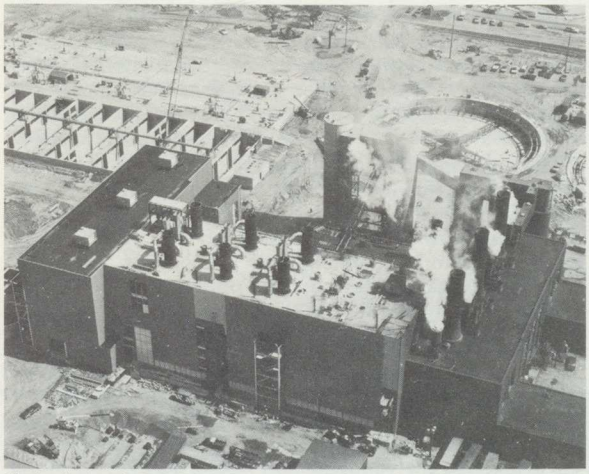


Final tanks



Sludge incinerators

RESULTS OF DETROIT'S SEWAGE TREATMENT PLANT TESTS

"You have to remember that this was the first time the plant operated as a full scale secondary treatment facility", Joe Moore told your editor. He is the man Mayor Coleman Young appointed to do whatever he needed to make the Detroit Wastewater Treatment Plant meet deadlines which Federal Judge Feikens set out in his ruling against the City of Detroit.

"The facility met all but one of the limits set in the Court's ruling and it can do better with some modifications and full staffing", said Moore.

At the request of the Federal Court, a full-scale evaluation of the Detroit facility was conducted according to a plan approved by the Court last summer.

In November, the Test Steering Committee submitted its report on the Full Plant Scale Evaluation of the Detroit Wastewater Treatment Plant to the Court. The evaluation included plant equipment, its capacity, operating conditions, plant personnel and overall treatment performance. The test period was August 1 through October 26 and focused upon detailed records of plant operations for the final 30 days.

The purpose of the evaluation was to determine whether the plant could operate to achieve the effluent limitations ordered to be in effect by December 31, 1979. The plant operated as an activated sludge secondary treatment system in compliance with effluent limitations in its present permit. It met the new limits with the exception of suspended solids concentrations and a minor grease and oil deviation.

During the test period September 26, 1979 to October 26, 1979, each component of the system was observed under actual operational conditions and evaluated as to its capability to meet the effluent limitations.

Flow through the plant during this period averaged 541 MGD, lower than the average flow for this time of the year and well below the 1,000 MGD flow on which the effluent load limits are based.

Final clarifiers were unable to meet the TSS (total suspended solids) effluent limitations. However, testing of modifications to one clarifier and control of surges in flow through the clarifiers indicate that meeting the Consent Judgment effluent limit of 30 mg/L at the estimated 1980 maximum month flow of 825 MGD may be achieved by modifying the final clarification system.

Based on data and observations, the Test Committee reported to the Court:

- December 31, 1979 effluent discharge limits for phosphorus, BOD_5, phenol, pH and fecal coliform were met.

- The 30-day and 7-day total suspended solids averages were 65 mg/L and 83 mg/L and did not meet the limitations of 30 mg/L and 45 mg/L, respectively.
- The final clarifiers could not meet the limits; however if the Committee's recommended modifications are performed, the 30 mg/L can be met.
- Dewatering capacity is insufficient at the present time to handle sludge generated at 825 MGD; existing incineration installation is also inadequate;.
- Modification to equipment and processes, proper operations, and substantial addition to sludge dewatering and incineration capacity will be needed to make these units sufficient.
- If upset events are minimized by control of hourly flow surges to final clarifiers and the recommended modifications are made, more flow can be treated, but the secondary system capacity will still fall short of meeting requirements for a 1,000 MGD flow.
- Maintenance procedure improvements, increased staffing and training, as well as improved internal communications have improved the operational efficiency of the plant. Additional training and staffing is expected to further improve the overall performance of the system.

The one-month test period of full scale operation of the secondary system included the start up problems usually associated with a large scale complex system. Some parts of the plant are yet to be constructed and modifications are needed for equipment and procedures. However, enough information was obtained during this brief period to give an optimistic view of the plant's capability to meet the Consent Degree effluent requirements.

COURT ORDERED EFFLUENT LIMITATIONS

	TO DEC. 31, 1979		DEC. 31, 1979-DEC. 31, 1981		TEST RESULTS	
	30-day Ave.	7-day Ave.	30-day Ave.	7-day Ave.	30-day Ave.	7-day Ave.
BOD_5 (mg/L)	70	105	30	45	30	38
TSS (mg/L)	110	170	30	45	65	83
Phenol (mg/L)	.25	.3	.1	.2	.019	.021
Oil and Grease (mg/L)	-	30	-	15	14.3	15.1
T. Phosphorus (mg/L)	4.0	-	2.5	-	2.0	2.6
Fecal Coliform (#/100 mL)	200	400	200	400	41	79
pH (SU)	6.0-9.0	6.0-9.0	6.0-9.0	6.0-9.0	6.7	6.7
			Specified Flow 1,000 MGD		Ave. Test Flow 541 MGD	

YEAR OF THE COAST

To focus public attention on the value of the coast, including the Great Lakes coast, and the dangers of further degradation of its vitality, 1980 has been designated YEAR OF THE COAST. During this year, a huge, diverse national campaign will occur. Its purpose is to educate millions of people about the importance of protecting, conserving, and restoring the coast.

Throughout the country, groups and individuals are making plans to participate in YEAR OF THE COAST. Three periods are being suggested for peak levels of activities and publicity: May 9-11 SPRING AND THE COAST: August 2-9 COAST WEEK: and October 3-5 AUTUMN ON THE COAST.

If you or your group wants help to plan a local event, write to the Coast Alliance, a non-profit organization formed early in 1979 by a group of concerned individuals who feel that a major national initiative is needed to halt the deterioration of our vital coastal resources.

In addition to serving as the national coordinator for YEAR OF THE COAST, the Alliance is working on suggested changes in the administration of federal coast-related programs and comprehensive proposals for national legislation for coast protection and enhancement. You can ask for planning help by contacting: Year of the Coast, P. O. Box 2708, Washington, D.C. 20013; telephone (202) 466-7260.

DECISION CONFERENCE

by Elaine Kaplan

Interstate Water Quality Project Director
Purdue University Calumet

"I went home with 15 ideas to put into action as a result of the Conference," said Ginny Woods, of the Northwest Michigan Regional Planning and Development Commission. Ginny was one of the representatives from agencies who joined graduates of the Decisions for Lake Michigan Program at the Pick-Congress Hotel in Chicago, October 26 and 27 to examine issues involved in improving the water quality of Lake Michigan.

If their evaluation forms reflect their feelings, the trainees found the two days useful.

"This conference added to our course. It focused the factual information of the course into a scheme of goal identification, management and implementation."

"It gave us a sense of continuity—from education through action."

This enthusiasm was generated by interactions among all attendees, including key speakers. Lee Botts, Chairman, Great Lakes Basin Commission, identified Lake Michigan today and tomorrow issues: toxics, energy siting, coastal zone management, and others. With slides and a lecture, Hallet Harris of Wisconsin Sea Grant gave an overview of ecosystem rehabilitation in the Great Lakes.

Dinner speaker, Jack Vallentyne sprayed participants with symbolic "acid rain" he said he had brought from New York. He made us laugh, but while he entertained the audience, he conveyed a serious message: Man will have to redirect his behavior. We are living in an industrial society that does not respond to environmental "feedback." All activity has a positive or negative feedback indicating balance or lack of balance. We must learn to recognize and use the indications of imbalance.

Larry Aggens, consultant and planner with the Northeast Illinois Regional Planning Commission, spoke of the perils and politics of public participation. Discrepancies between political, professional, and public decisions can result in selection of a management alternative that satisfies no one, he warned. Solving this dilemma was a Conference issue.

At mini-instruction workshops tools were offered to help motivated citizens enter the water management decision process. These workshops included:

1. Administrative and legislative lobbying conducted by Caryl Terrell - Wisconsin Citizens Environmental Council; Jeanne Millen - Illinois, Indiana Bi-State

Planning Commission; and Walt Pomeroy - Great Lakes Basin Commission.

2. Litigation and public intervention, conducted by Richard Robbins - Lake Michigan Federation; Bill Forcade - Citizens for a Better Environment; George Wolff - Illinois Attorney General's Office; and Tom Dawson - Public Intervener, Wisconsin.
3. Advisory Boards and Commissions, conducted by Dorothy Lagerroos - Lake Michigan Federation Board; and Pat Bonner - International Joint Commission.
4. Obtaining and giving information, conducted by Janet Keck - freelance writer and news reporter; Nancy Huang - Great Lakes Information; and Susan Nelson - Environmental Protection Agency, Region V.

Meeting in state caucuses, participants developed strategies for dealing with Lake Michigan problems.

Illinois' Ken Johnson said his caucus decided to continue education by concentrating on specific sites involving wider publics. Indiana training coordinator, Robert Rivers, will help his group convene a seminar early in 1980 on Indiana laws, regulations and agencies. Building on the Water Quality Training Decisions course, the Indiana Conference delegation will form an on-going organization that will gather and share information, structure workshops, and find out how to get into the system.

Wisconsin's Mary Ann Rodewald said that trainees and agency representatives fought their way through issues only to find they like each other and wanted to form a coalition. As a result, they issued a manifesto. The manifesto objective is to promote and foster the development of a holistic and cohesive approach to the management of the resources of Green Bay waters and adjacent coastal lands. This objective will be attained by a continuing education of decision makers and "stake holder" groups regarding the importance and validity of moving toward ecosystems management. Key issues will be identified and agency and political dysfunctions determined so that strategies can evolve. This Wisconsin lobby for the Green Bay ecosystem held its first meeting in Green Bay November 29th.

Diane Worden reported that the Michigan caucus developed a strategy on toxic wastes. This strategy ruled out litigation as premature, costly, and time consuming. They will - as a group and individually - determine issue status, watchdog development of regulations, reach the Governor's office and legislators for timely input into legislative discussions, and apply for membership on agency boards. A letter from the Michigan group shortly after the conference indicated that Diane had sent out an update on agency and citizen involvement in solid and hazardous wastes in the state.

Delegates from the four involved states recommend the continuation and enlargement of the Decision course. A proposal "Decisions for the Great Lakes" has been submitted to agencies and organizations in the United States and Canada so that a similar program can be developed for trainees throughout the Great Lakes Basin.

The Decisions curriculum prepared for trainee use is being expanded and will be reissued for distribution and use in university courses, or as source material for high schools, workshops, seminars, and media articles. Inquiries should be mailed to Elaine Kaplan, Water Quality Training Program, Purdue University Calumet, Hammond, Indiana 46323, or you can call Elaine at (219) 844-0520, Ext. 331.

CHLORINE OBJECTIVE TASK FORCE

by J. A. Donnan and D. A. Bondy

The Chlorine Objective Task Force presented its findings to the Water Quality Board at its December 13 meeting in Toronto. The Task Force was established in May 1978 to assess the social and economic implications of approaching or achieving the proposed ambient objective for residual chlorine of 0.002 mg/L. The Task Force determined the extent to which chlorine disinfection practices contribute to potentially hazardous chlorinated organic chemicals in the Great Lakes and in drinking water supplies. The Task Force also evaluated alternative technologies and strategies for the disinfection of sewage treatment plant effluents in the Great Lakes Basin.

This is the first such socio-economic assessment ever undertaken for the Water Quality Board. The methodological framework used in this analysis identified the various social and economic consequences that might result in the course of achieving the proposed objectives. Quantitative measures of these consequences, together with knowledge of how they are distributed among different groups or sectors, are necessary to make assessments that will lead to choices about which actions to take.

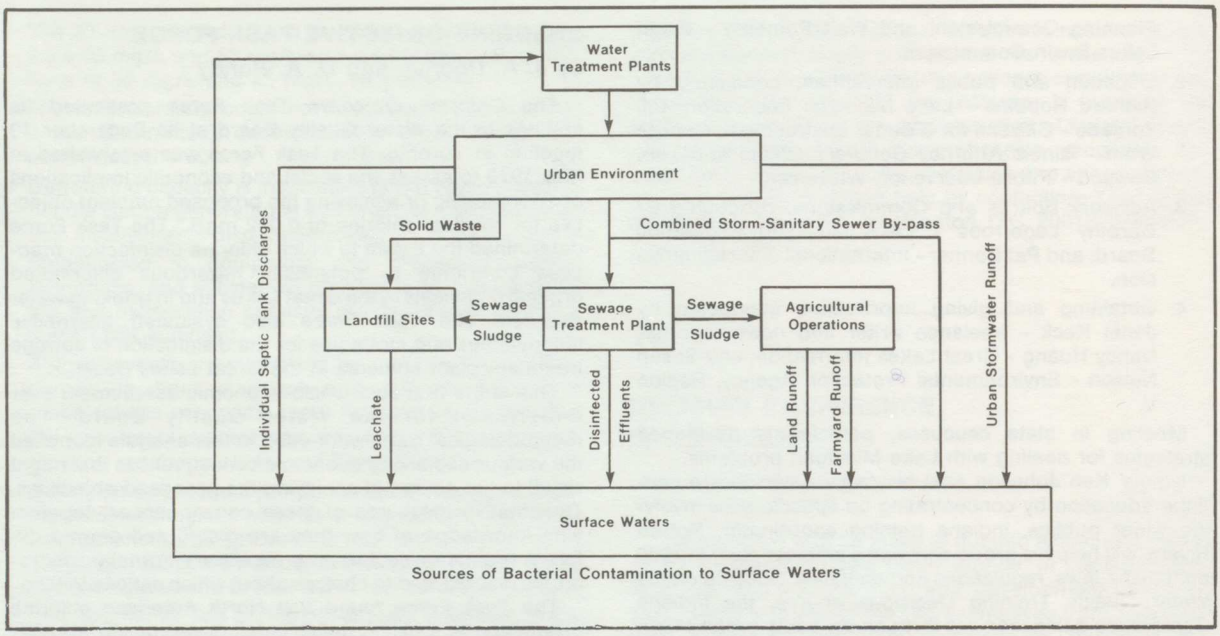
The Task Force found that North American chlorine production is a billion dollar industry producing approximately 11 million tonnes a year. Major chlorine consumers are the chemical industry, solvents and plastics manufacturers, and the pulp and paper industry (especially in Canada). Only about 5% of chlorine production is used for purposes of water and wastewater disinfection. The intermittent use of chlorine in power plants to maintain condenser tube cleanliness for proper heat transfer is significantly smaller than municipal use.

Sewage treatment plants constitute the major continuous source of free chlorine residual. There is, however, little documentation of identified residual chlorine problem areas in the Great Lakes. Consequently, the benefits of approaching or achieving the chlorine objective in terms of protecting aquatic life are difficult to determine with any accuracy.

The contribution of chlorinated organics due to chlorination of sewage and power plant water is insignificant when compared with industrial discharges. Fortunately, very little of these residues find their way into drinking water supplies. The principal source of halomethanes and other chlorinated organic compounds found in treated drinking water are formed by the chlorination of humic matter during drinking water treatment and they do not enter the plant from industrial or municipal waste discharges.

Bacterial contamination in surface waters can result from a variety of sources as shown in the accompanying diagram. Coliform bacteria in surface waters are used as indicators of the possible presence of pathogens. The disinfection of sewage treatment plant effluent is considered to be the primary method of controlling the numbers of indicator organisms and their associated pathogens in effluents and in receiving waters. In the Great Lakes Basin, chlorination is presently the most commonly used method for sewage effluent disinfection. Health and sanitary engineering authorities are not unanimous about the need for disinfection of wastewaters and about the health risks associated with reduced disinfection. It is the Task Force's opinion that seasonal disinfection and, even in some rare cases, no disinfection could be viable strategies.

Approximately 150 chlorine related accidents are reported annually in Canada and the United States. Any



Sources of Bacterial Contamination to Surface Waters

accidental, uncontrolled release of chlorine gas must be treated as an emergency. Risk of accidental release of chlorine during its transportation, handling, application and storage is a real source of social and economic concern. The disinfectant users do not account for large amounts of chlorine used (5%), but there seems to be a disproportionate number of related incidents (19%) because these users require more handling of the chemical. The recent train derailment in Mississauga, Ontario, and the subsequent evacuation of about 250,000 residents because of the release of chlorine gas from a single railway tank car illustrates the seriousness of the risks associated with chlorine. However, reducing or eliminating sewage treatment plant effluent chlorination would probably not significantly reduce the frequency of transportation related accidents.

Seasonal chlorination, which is already practiced in most Ontario sewage treatment plants, could be implemented on a wider basis in the United States Great Lakes Basin with a maximum potential savings of about $1.5 million per year, with reduced damages to aquatic life and habitat during the non-chlorination cold season and with no perceived changes in public health risk. If wastewater disinfection were to be eliminated entirely throughout the Great Lakes Basin, the chlorine objective would be achieved and there would be an approximate saving of $4.2 million per year. Aquatic life and habitat would be protected year-round, but risks to public health would be perceived to be increased, particularly in terms of recreational waters.

Key recommendations made by the Task Force are that:

EVALUATION OF STRATEGIES FOR ACHIEVING Cl_2 OBJECTIVE IN STPs

STRATEGIES	FINANCIAL IMPLICATIONS ON EXISTING PLANTS		EFFECTS ON AQUATIC LIFE	PUBLIC HEALTH RISK		EXTENT OF ACHIEVING Cl_2 OBJ.	GOV'T. ENFORCEMENT ACTIVITIES		REMARKS
	CAP. $	O&M $		WATER SUPPLY	RECREATION		INITIAL IMPLEMENTATION	MONITORING	
1. More efficient Chlorination	▲	▲ ▼	▼	0	0	▲	▲	▲	
2. Seasonal Chlorination	0	▼	▼	0	0	40-60% of year	▲	0	Subject to receiving water uses.
3. Dechlorination	▲	▲	▼	0	0	100%	▲	▲	
4. Alternative Disinfection Technology	▲	▲	▼	0	0	▲	▲	0	Primarily relevant to new or expanded plants.
5. No Disinfection	0	▼	▼	▲	▲	100%	▲	▲	Health risk perceived to be increased.
6. Improve Outfall Structures	▲	0	▼	0	▼	▲	▲	0	Option is very site-specific.

▲ - Increase ▼ - Decrease 0 - No Change

1. All jurisdictions undertake to improve the efficiency of present chlorination practices where cost savings warrant.
2. The United States jurisdictions consider implementing seasonal disinfection as is the current policy in most of Ontario.
3. Before embarking on new and refined wastewater disinfection technologies, resources should be devoted to improving and upgrading municipal wastewater treatment facilities.

The Task Force's 150-Page report will be available from the IJC's Regional Office when released.

Mr. Donnan chairs the Chlorine Objectives Task Force; Mr. Bondy is the group's Secretary.

EVENTS

Great Lakes - '80 Annual Conference of the International Association for Great Lakes Research (IAGLR) will be held at Queen's University, Kingston, Ontario from May 19 to 22. In addition to scientific sessions, the Conference Theme "Towards An Ecosystem Management Strategy" will be addressed by a number of internationally known scientists and environmental managers. Contributed papers both on the conference theme and on any aspect of science relevant to the Great Lakes are welcome. Further information can be obtained from: Dr. E. D. Ongley, Great Lakes - '80, Queen's University, Kingston, Ontario, Canada K7L 3N6.

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On April 15-16, 1980, the University of Toronto will sponsor and host *Wastewater Treatment Workshop 80,* a two-day workshop on value engineering in wastewater treatment plant design, use of wetlands and marshes, evaluation of equipment, and development of treatment technology and hazardous wastes management. Details can be obtained from Dr. J. Ganczarczyk, Dept. of Civil Engineering, University of Toronto, Toronto, Ontario M5S 1A4. Telephone: (416) 978-3141.

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Inland Waters '80 will be a specialty conference cosponsored by the American Water Resources Association-Wisconsin Section and Wisconsin Sea Grant July 30 through August 1, 1980 in Green Bay. The theme is Land and Water Management in Inland Coastal and Riverine Areas. For details write to Technical Programs Chairman, Edward Silberman, University of Minnesota, St. Anthony Fall Hydraulic Lab., 3rd Avenue S.E. and Mississippi River, Minneapolis MN 54302 or call (612) 373-2782.

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LAW AND THE COURTS

The Environmental Defense Fund filed suit against U.S. EPA because the agency's ban still allows PCBs use in transformers and capacitors as long as certified technicians service the equipment. (Leakage can occur during repair operations.)

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Frank Kelley, Michigan's Attorney General, filed suits against Chemical Recovery Systems Inc. and the Wurtsmith U.S. Air Force Base. The company is charged with dumping chemical wastes which leached to the Ecorse River. TCE (trichloroethylene) is said to have been dumped by the Air Force, causing contamination of Lake Huron and the AuSable River. The state is expecting clean up of the spills to be monitored by the courts. (*Air/water pollution report,* September 10, 1979).

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A sub-section of the proposed amendment to the PCB regulations developed under the Environmental Contaminants Act, and published in the *Canada Gazette* on December 2, 1978, prohibits the use of PCBs as new filling or as makeup fluid in the servicing of electrical transformers.

Formal notices of objection to the proposed amendment were filed and withdrawn by the Iron Ore Company of Canada, Labrador City, Nfld. and the Eurocan Pulp and Paper Company of Kitimat, B.C. Despite the withdrawal of all objectors, a meeting of the PCB Board of Review was held December 7, 1979 in the event that interested and knowledgeable parties wished to be heard on the government's proposal to amend the regulations. A statement containing the government's view of the role of the Board is available on request.

Address any inquiries to Dr. Hazen Thompson, Executive Secretary, PCB Board of Review, c/o Contaminants Control Branch, Environment Canada, Ottawa, Ontario K1A 1C8, or telephone (819) 994-1861.

BOOKSHELF

Reviewed below are some resource publications dealing with the materials available for marine education in general and Great Lakes education in particular.

Educators' Guide to Great Lakes Materials. 1978. University of Wisconsin, Sea Grant College Program, 1800 University Avenue, Madison, Wisconsin 53706; Publication WIS-SG-78-600, 39 pp., 25¢. This bibliography is intended to provide educators of grades 6-9 with a guide to sources of Great Lakes information suitable for classroom use (books, films, maps and charts, booklets and serials). Materials are concerned with history, art, science, lake management, and environmental quality. No scientific works before 1970 are included. Items are annotated and rated for value in different situations.

Water-Related Teaching Activities, by Herbert L. Coon and Charles L. Price, 1977. ERIC Center for Science, Mathematics, and Environmental Education, The Ohio State University, 1200 Chambers Road, Columbus, Ohio 43212; ED 150 026, 149 pp., $4.00. Activities are suggested for all grade levels and subject areas to help students learn about water resources. Most are science activities (77) or social studies (46), but several in math, art, music, and language arts are included. The last section contains lists of films, filmstrips, and water testing equipment which are available.

Marine Geology and Geophysics Data Services and Publications. 1976. NOAA, National Geophysical and Solar-Terrestrial Data Center, Boulder, Colorado 80302; 11 pp., free. This listing provides a brief catalog of NGSDC's products and services in marine geology and geophysics. Maps, charts, photographs and data files are described, with prices and suggested usage. Materials included are extensive and technically oriented.

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NIAGARA WATERLOG by F. Berkes, J. Bloomfield, L. Curtis, K. Kobayshi, C. Prescott and D. M. Salm, is a compilation of data on water quality and the uses of the Lake

Erie, Lake Ontario and the Niagara River Shorelines of Region Niagara. It was prepared by a team of students under an Ontario Ministry of the Environment Experience '79 grant, supervised by Prof. F. Berkes. It is 169 pages including appendices/illustrations/maps, and is available (at cost) for $6.00 from: the Institute of Urban and Environmental Studies, Brock University, St. Catharines, Ontario L2S 3A1.

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The Lake Erie Wastewater Study of the United States Corps of Engineers has published:

"*Chemical Extraction as an Index of Bioavailability of Phosphate in Lake Erie Basin Suspended Sediments,*" LEWMS Technical Report, U.S. Army Corps of Engineers, Buffalo, New York, January 1978.

"*Biological Availability of Total Phosphorus,*" LEWMS Technical Report, U.S. Army Corps of Engineers, Buffalo, New York, January 1979.

"*Honey Creek Watershed Report,*" LEWMS, Technical Report, U.S. Army Corps of Engineers, Buffalo, New York, December 1976.

"*Methodology for Evaluating In-lake Effect Resulting from Phosphorus Management in the Lake Erie Drainage Basin,*" LEWMS Technical Report, U.S. Army Corps of Engineers, Buffalo, New York, July 1978.

U.S. Army Corps of Engineers, Buffalo District,Lake Erie Wastewater Management Study, "*Water Quality Data - Sandusky River Material Transport,*" Buffalo, New York, 1978.

Requests for copies of the above reports should be submitted in writing to: Mr. Wayne Dubrawsky, Water Quality Section, U.S. Army Corps of Engineers, 1776 Niagara Street, Buffalo, NY 14207.

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The United States Environmental Protection Agency has published "Acid Rain Research Summary," an excellent overview booklet. Copies are available from: Publications, Center for Environmental Research Information, U.S. EPA, Cincinnati, Ohio 45268.

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Environment Canada has also published an informative acid rain brochure. "Blowing in the Wind" in both English and French. It is available from: Environment Canada, Atmospheric Environment Service, Information Directorate 4905 Dufferin Street, Downsview, Ontario M3H 5T4 or by calling (416) 667-4723 in Toronto.

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The Annotated Bibliography of reports published under the Pollution from Land Use Activities Reference Group will soon be available. Each of 121 reports is described and its available forms are noted. Copies are available from the IJC's Great Lakes Regional Office, 100 Ouellette Avenue, Windsor, Ontario N9A 6T3.

CANADA-ONTARIO GREAT LAKES SHORE DAMAGE REDUCTION PROGRAM

by Chris Endemann

The Great Lakes shores of Canada are a vital natural resource. Growing demands on water-oriented recreation, expanding residential, commercial and industrial development and the need for newer and larger port facilities have greatly increased both the use and importance of waterfront property. Yet, many of our most valuable shores are extremely prone to erosion and flooding. If shores are left unprotected or allowed to be developed without regard to natural forces, they may suffer rapid and extensive damage.

Erosion and Flooding

The Great Lakes have extended periods of low and high water levels. High water levels in the early 1950's caused very serious erosion and flooding on the Great Lakes. But a low water period followed in the mid 1960's, and extensive shore property development started in areas of potential hazard. The result, in the high water periods of the fall and spring of 1973, was about $20 million in flood and erosion damages along the Canadian shores. Above normal precipitation has continued and the levels remain high, greatly increasing the possibility of further shore damage.

Lakeshore property holds great attraction. Because of that attraction, people who want to live in the coastal zone too often are blind to potential dangers.

Location and Access

The transportation capability, water supply availability and aesthetic features of the Great Lakes have attracted a variety of users. This has placed increasing stress on the shore ecosystem.

The stress is worsened because the shores are accessible to the bulk of Ontario's population. Over 50% of the population lives in Great Lakes shoreline municipalities.

Shoreline Damage

Most shoreline damage occurs where it has in the past, but people forget or new owners are not told. A long term planning approach is necessary to regulate development within flood- and erosion-prone areas to reduce otherwise costly damages in the future.

Unless something is done to control improper shorelands use, damage and possible danger to life will continue. Costs to repair damage are borne by all taxpayers through government aid at municipal, provincial and federal levels.

Shore Damage Survey

In 1973 Fisheries and Environment Canada and the Ontario Ministry of Natural Resources initiated the Canada-Ontario Great Lakes Shore Damage Survey to: compile data detailing the extent of 1972-1973 damages; provide information on shore characteristics; and make shoreland management recommendations. The survey extended approximately 2,000 km from Port Severn on Lake Huron to Gananoque on Lake Ontario.

Technical Report and Atlas

The resulting Technical Report and Coastal Zone Atlas were released in 1976. The Report recommended follow-up programs to reduce shore damage. As a result, the two governments established a coastal task force to carry out a number of damage reduction programs.

Hazard Land Mapping

Using photomosaics from the Coastal Zone Atlas, 1:10,000 scale maps have been prepared delineating all flood and erosion prone areas on the Great Lake erodible shoreline. Three lines appear on these maps - the 1:100 year flood level, the 100-year erosion limit and a line indicating highly dynamic beach areas.

Information contained in these maps is now being used by many shore municipalities and conservation authorities in official plans, zoning by-laws, fill and construction regulations, and for land development applications. They are also employed as an aid in developing shore management plans.

Shore Management

Land use controls, public land acquisition and shore protection measures are the basic management alternatives to reduce flood and erosion damage. The suitability of one or a mix of these alternatives depends on the physical and socio-economic conditions of the area and their environmental effects.

A shore management study was undertaken to develop methodologies for evaluating alternatives and to compile a Shore Management Guide to aid in developing a shore management plan. A thirty-kilometre length of Lake Erie shore was selected as a model study site to evaluate methodologies and serve as an example of a practical application of the Guide.

Guide

The Shore Management Guide is mainly directed to planners, coastal engineers, environmentalists and economists working as multi-disciplinary study teams developing shore management plans in areas susceptible to flooding and erosion.

When implemented, plans based on the Guide, should achieve the following shore management goals:

1. Minimize property damage and loss of life from flooding, erosion and associated hazards in the shore zone.
2. Encourage optimum economic and social utilization of the shore zone through a combination of public and private management and development.
3. Minimize detrimental environmental effects of development and preserve natural functions of sensitive shore ecosystems.

The scope and complexity of the interplay of physical, biological and socio-economic elements within the shore zone is enormous. The Guide is not intended to deal comprehensively with all of the aspects which could be present at any specific site. However, the overall framework is flexible enough to accommodate any methodologies tailored for site conditions.

Public Awareness

In 1976, a four-year public information plan began. Brochures and letters explaining the importance of discriminating selection of shoreline property were mailed to

over 35,000 shoreline residents, municipalities and conservation authorities. Workshops, slide shows, videotape productions, radio and television public service announcements and other forms of advertising have since been employed to heighten awareness of shoreline problems and promote more judicious use and development of shoreline property. There has also been a continuing liaison with the Great Lakes Basin Commission and its public awareness activities in the United States.

Increased public awareness should contribute to the use of responsible development practices and land use zoning regulations and thereby reduce the potential for shoreline damage.

For further information on the Canada-Ontario Great Lakes Coastal Program, please contact: Mr. Chris Endemann, Regional Director General's Office, Environment Canada, 55 St. Clair Avenue East, Toronto, Ontario M4T 1M2, Telephone: (416) 966-5840 or Robert Keir, Information Services, Ontario Ministry of Natural Resources, 99 Wellesley Street West, Toronto, Ontario M7A 1W3, Telephone: (416) 965-2756.

AGREEMENT INFORMATION ACTIVITIES

Perhaps you have already tried to read and understand the Great Lakes Water Quality Agreement of 1978. Or perhaps you have just heard about it, and would like to know more. In either case, the International Joint Commission is now preparing an information kit about the Agreement. It will consist of a basic booklet, a couple of brochures, and some fact sheets.

The booklet will outline the topics included in the Agreement and provide a brief description of each of them. The brochures will contain more in-depth information on the subjects of toxic substances and phosphorus control, as they are treated in the Agreement. We expect to add the fact sheets on other aspects of the Agreement as appropriate.

All of this material will be coordinated with a slide/tape show about the Agreement now being produced by the Commission. The show gives a brief history of Great Lakes pollution problems and explains the efforts to remedy them. It states the functions which Agreement organizations and governments are supposed to perform. Potential citizens' activities relating to the Agreement are also emphasized.

The basic booklet and brochures should be available for distribution early in 1980. Write to the IJC Windsor Office if you are interested in receiving any or all of them, and if you know of a group which would like to use the slide/tape show.

Carol Young Swinehart is working on this project for the coming year. She will help you schedule the use and distribution of the materials in the kit, as well as the slide/tape program. Carol has been news director of WRDD/WMCM-AM in Bay City, Michigan, for the past four years. She was a member of the Public Involvement Work Group of the Great Lakes Basin Commission from 1976 to 1979. She has been active for several years in the League of Women Voters in three sub-basins of the Great Lakes. Carol also was involved in organizing the 1977 Upper Lakes Reference Group Workshops of the IJC.

ASAP

More than 700 people participated in the Action Seminar on Acid Precipitation in Toronto, November 1-3. Conference planners were delighted with the level of interest expressed. Attendees found the conference highly informative. Speakers presented extensive information and workshops helped participants better focus on components of the acid rain issue.

Though papers are not available as yet, copies of the speeches and workshop presentations are available on tape cassettes at $6.00 per tape. For a list of available tapes, write to: Lee-Rec, R. R. #1, Port Sydney, Ontario P0B 1L0.

Resolutions

During the final session of the conference participants agreed to the following resolutions:

WHEREAS acid precipitation has caused marked and dramatic damage to ecosystems and regional economies, rendered hundreds of lakes lifeless, decimated sport fisheries, impaired visibility, and threatened agriculture, tourism and forest industries and the public health and welfare of citizens throughout North America; and

WHEREAS existing atmospheric loads of sulphur and nitrogen oxides are directly contributing to dry deposition and rain and snow fall at least 50 times more acidic than normal, with isolated episodes reaching thousand fold increases in acidity; and

WHEREAS acid precipitation and its damages will continue to escalate as Canadian and U.S. industries shift toward a greater reliance on coal; and

WHEREAS existing air quality standards and legal requirements are clearly inadequate to control acid precipitation, having allowed the sharp increase in long-range pollution over the last two decades; moreover, federal, state, and provincial governments, especially in the Ohio River Valley and Ontario have failed to take adequate control actions; and

WHEREAS both the U.S. and Canadian governments have recognized the need for a cooperative approach to this international problem; but have not yet agreed on specific terms to further regulate sulphur and nitrogen oxide emissions.

THEREFORE, THE CITIZENS PARTICIPATING IN THIS ASAP CONFERENCE RESOLVE:

THAT each country must immediately adopt and implement a control policy for both new and existing sources to reduce the overall atmospheric loads of sulphur and nitrogen oxides to less than 50% of present levels within ten years, with regular incremental reductions during that decade.

THAT national energy policies are critical to curtailing acid precipitation, with special emphasis placed on:

a) energy conservation and renewable energy resource development as the highest priority;

b) the use of national and unconventional gas as a preferred substitute for oil in the transition period;

c) the direct use of coal encouraged only in utility and industrial boilers with best available control technology;

d) the conversion of existing facilities from oil to coal only where the resultant emission rates will not increase

THAT the international treaty now under negotiation by Canada and the U.S. must establish the goal of reducing transboundary and regional air pollution levels through the adoption and enforcement of stringent emission control strategies.

THAT the participants are committed to seeing that this treaty is enforced, and that a commission of citizens from both countries should be established to monitor and report publicly on each country's record of compliance.

THAT research not be a substitute for immediate control action but that investments by both countries be increased particularly with regard to the economic and other effects of acid precipitation and associated pollutants on materials, drinking water quality, crops, forests, rangelands, and aquatic ecosystems.

THAT both governments educate the general public, and especially the threatened agricultural, tourist, and forestry industries, about the dangers of acid precipitation and encourage public participation in government decision-making.

THAT new emission standards must emphasize presently available control techniques, such as coal pre-washing, use of low sulphur fuels, fuel gas desulphurization and denitrification; and furthermore, that techniques to disperse emission in space or time, such as increased stack height and intermittent control systems should be prohibited.

THAT each country adopt special siting and control policies and standards to preserve and protect existing pristine air quality parks and wildernesses.

THAT workers can and must be protected from choosing between their jobs and a healthy environment.

THAT federal, provincial, and state governments participate in all available legal actions which will reduce sulphur and nitrogen oxide emissions and acid rain.

Regional Caucus

What happens with those resolutions depends on what participants in the event do. Your editor attended one of the regional caucuses, the one for West Virginia, Ohio, Michigan, Indiana, Illinois, Pennsylvania and New Jersey. That group proposed a strategy for constituency building which includes:

- sharing the information gathered from the Conference with other organized groups;
- talking to regional, local and state elected and appointed officials as well as government agencies about the importance of the acid rain problem;

- organizing a Regional Conference on Long Range Transport of Air Pollutants (LRTAP) and the Clean Air Act with emphasis on solutions to the acid rain problem; and,
- working to make acid rain a politically sensitive issue during the United States 1980 election.

GASP (Group Against Smoke and Air Pollution) of Pittsburgh agreed to keep the causus members informed, perhaps via a newsletter. GLT (Great Lakes Tomorrow) committed to "watchdog" the Water Quality Agreement and upcoming developments under the Air Quality Agreement, and to inform GASP so others in the caucus can act.

PEOPLE

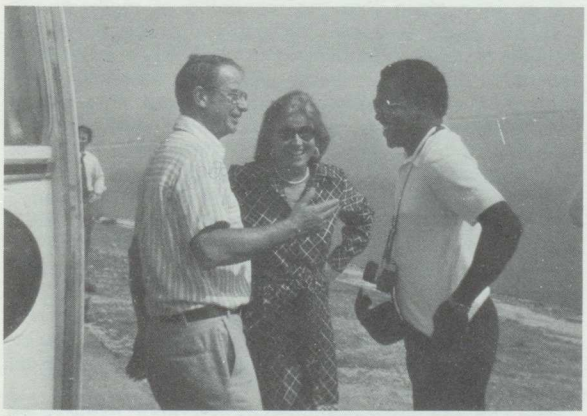
Mrs. *Jean L. Hennessey,* the first woman to serve as a member of the International Joint Commission, was named to the Commission's United States Section by President Jimmy Carter in August 1979.

Mrs. Hennessey, 52, formerly served as director of the New Hampshire Council of Management and Budget in the Office of the Governor. As chief fiscal advisor to New Hampshire Governor, Hugh J. Gallen, Mrs. Hennessey was responsible for the development of tax policy alternatives and established a Revenue Forecasting Council and a Property and Debt Management Council.

She also operates a consulting firm for individual, foundation and corporate philanthropy, Jean L. Hennessey and Associates.

Mrs. Hennessey is active in a variety of civic, environmental and governmental affairs. They include: trustee, Environmental Law Institute, Washington, D.C., New England Resources Council, New Haven, Conn., and, Population Resource Center, New York, N.Y.; member, New Hampshire Rhodes Scholar Selection Committee, and Board of Overseers of Dartmouth Broadcasting; and director, Planned Parenthood Federation of America, New York, and the New Hampshire World Affairs Council.

A graduate of Vassar College, she is the mother of two children. Her husband, John W. Hennessey, Jr., is Third Century Professor at the Amos Tuck School of Business Administration, Dartmouth College.



Commissioner Jean Hennessey with Soil Conservation Service representatives at Muskegon County's (Michigan) wastewater management site.

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The new U.S. ambassador to Canada is *Kenneth Curtis,* former IJC Commissioner.

He was sworn in as Ambassador to Canada September 29, 1979 by Vice-President Walter Mondale. He replaced Thomas Enders, who served as Ambassador to Canada for three and a half years.

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Norman A. Berg, the U.S. Chairman of IJC's Pollution From Land Use Activities Reference Group, is the new Administrator of the U.S. Department of Agriculture's Soil Conservation Service (SCS).

Berg has been associate administrator of SCS since 1969. A career employee of SCS since 1943, he served in Idaho and South Dakota before moving to Washington, D.C. in 1969 as an assistant to the SCS Administrator. From 1965 to 1968, he was deputy administrator for field services.

A graduate of the University of Minnesota, Berg holds a master's degree in public administration from Harvard University. He is a member of the secretary's Coordinating Committee for the Soil and Water Resources Conservation Act; and a charter member and fellow of the Soil Conservation Society of America.

CONGRESSIONAL HEARING IN DETROIT

Michigan Congressman James Blanchard brought the United States House of Representatives Subcommittee on Natural Resources and the Environment to Detroit on November 19 for a one-day hearing. The group received testimony from authorities on the management of toxic wastes and their effects on ground and surface waters of the Great Lakes Basin.

The Subcommittee heard from Michigan's Attorney General, Frank Kelley; Dr. S. Aust of Michigan's Toxic Substances Control Commission and the Professor of Biochemistry who will soon head Michigan State University's new toxicology laboratory, as well as representatives of environmental groups and state and federal government programs.

Representing governmental programs were D. Bryson of EPA, Region V, Enforcement Division; Dr. E. Aubert of the National Oceanic and Atmospheric Administration's Ann Arbor Laboratory; two Michigan Department of Natural Resources enforcement personnel; Dr. Wayland Swain of EPA's Grosse Ile Lab., Michigan; and E. R. Cummings, Michigan District of United States Geological Survey. Environmental organizations were represented by Tom Washington of Michigan United Conservation Clubs, John Sobetzer for Michigan Environmental Councils (East and West), and Dr. T. Tomboulian of Sierra Club.

Cooperative programs were discussed by Lee Botts, Chairman of the Great Lakes Basin Commission; Carlos Fetterolf, Executive Secretary of the Great Lakes Fishery Commission, and Dr. Signey R. Galler, Deputy Assistant for Environmental Affairs from the Department of Commerce, who works with industry to improve disposal practice and encourage recycling as well as proper management of wastes. In addition, R. J. Sugarman, United States Chairman of the IJC, submitted a statement for the record.

According to William Liebold, aide to Congressman Blanchard, "Armed with knowledge provided in the testimony received at the hearing, the Subcommittee will be in a position to review budget requests from the various agencies of the United States Government. Now, when the Subcommittee sees the requests, the members will know which programs need more money and which can be eliminated. The group also plans to look for better and more effective ways to assure coordinated and cooperative programs."

The Natural Resources and the Environment Subcommittee has jurisdiction over all federal environmental research programs and their budget reviews.

DREDGING ACTIVITIES IN THE GREAT LAKES

by M. G. Brooksbank and D. A. Bondy

Man's influence on the Great Lakes System is reflected in the changes occurring within lake sediments. Populations of benthic organisms, which form relatively stable communities that integrate changes over long time intervals, have undergone shifts in species composition, distribution and abundance. These population changes are generally associated with the increasing abundance of more pollution-tolerant species. Loading of materials to the lakes from industrial, municipal, tributary and atmospheric sources has contributed to the enrichment of lake sediments with oxygen demanding organic matter and with persistent contaminants including heavy metals (mercury, lead, cadmium and copper) and chlorinated organics like the ubiquitous PCBs. Information on the biological availability and impact of these sediment contaminants is inconclusive and consequently the implications of their accumulation in the depositional basins of our lakes remain uncertain.

Dredging and dredged material disposal are recognized as activities contributing to the redistribution of sediments and contaminants in the Great Lakes System. Of the 10 million cubic metres of sediment dredged annually in the Great Lakes, more than 90% is associated with the maintenance of harbours and waterways for commercial navigation. The wide array of sediment contaminants in harbours, furnished by adjacent urban-industrial complexes and inflowing tributaries, can impose lethal stresses on aquatic organisms and present short and long term environmental impacts on dredging and disposal. In consideration of the potential negative impacts, the 1972 Great Lakes Water Quality Agreement recommended that the disposal of polluted dredged material in open waters be phased out. An International Working Group on the Abatement and Control of Pollution from Dredging Activities was established pursuant to the Agreement. Its 1975 report reviewed dredging practices, programs, laws and regulations, and recommended procedures for undertaking site-specific evaluations of dredging projects.

The environmental restrictions on dredged material disposal have led to the increased construction and use of confinement facilities such that, during the four year period 1975-78, approximately 70% and 50% of United States and Canadian dredging quantities respectively, were confined. The substantial costs of this program and the potential negative environmental impacts associated with the inadequate siting, design and/or operation of these facilities have required regulatory agencies to fully assess the various dredged material disposal options available.

In an attempt to provide both a consistent approach to the evaluation of dredging projects among Great Lakes jurisdictions and a holistic perspective of dredging on the lakes, the Water Quality Agreement of 1978 recommended the formation of a Dredging Subcommittee under the Water Quality Board. The terms of reference for this Subcommittee include the development of compatible guidelines for dredging activities and a register with information on significant projects which would allow for the assessment of pollution loadings from dredged materials to the lakes.

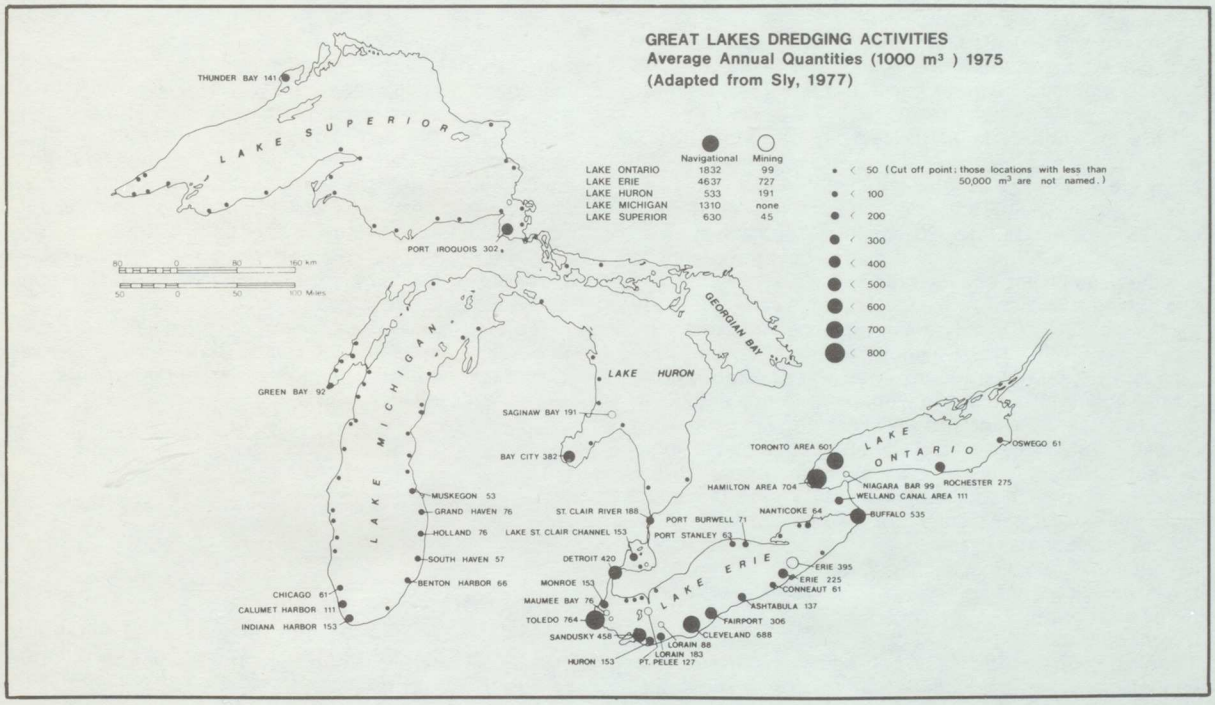
Following the initial discussions of the Subcommittee it was evident that a number of elements should be integral parts of the review of a particular dredging project.

1. Evaluation of Existing Information - an overview of past dredging and disposal activities, sediment quality history, and known environmental sensitivities of the area may allow conclusions to be reached on disposal options.
2. Physical Characterization of Sediment - the physical characteristics of a sediment provide an indication of the potential for chemical contamination and assist in the identification of possible uses of the dredged material, e.g. beach nourishment.
3. Chemical Characterization of Sediment - the chemical characteristics of the sediment, when compared to open lake bottom conditions, provide a relative indication of sediment quality and the potential for the dredged material to degrade the substrate at an open lake disposal site. Elutriate testing of the sediment provides further information on the readily available sediment constituents that can be released to the water column on disposal.
4. Bioassessment of Sediment - as the concern for dredging and dredged material disposal relates to the impact on biota, a preferred evaluative mechanism would be some form of sediment bioassessment. This would involve exposure of specified aquatic organisms to sediments and measuring lethal (acute toxicity) and sublethal (reproductive impairment, bioaccumulation of contaminants) responses. However, standard procedures and criteria to evaluate test results are still in the development stages.
5. Evaluation of Dredged Material Disposal Options - all practical alternatives to the discharge of materials to the waters of the Great Lakes should be considered. Dredged material, depending on the type of sediment and degree of contamination, has been beneficially used in a variety of ways on the lakes, including recreational and industrial improvement and waterway development.

It is recognized that the resolution of many of the problems associated with dredging and dredged material disposal rests with identification and control of sources of sediments and contaminants within the watershed. The application of appropriate guidelines and criteria can provide a reasonable approach to the environmental evaluation of dredging activities. There is a variety of programs within Great Lakes jurisdictions directed to this end. The Subcommittee believes that the IJC Reference Group on Pollution from Land Use Activities (PLUARG), the Dredged Material Research Program (DMRP) of the U.S. Army Corps of Engineers, and the development of legislative policies and guidelines for the control of toxic substances have produced results, recommendations, and measures which have the potential to significantly influence dredging and disposal operations in the Great Lakes.

The Subcommittee submitted its first report to the Great Lakes Water Quality Board in December. When released, copies of the 70-page report will be available from the IJC Great Lakes Regional Office.

Mr. Brooksbank chairs the Dredging Subcommittee; Mr. Bondy is the Group Secretary.



BRIEFS

Atomic Energy of Canada Limited (AECL) is drilling boreholes into granite rock formations not far from Atikokan, Ontario to see if the formation may be suitable for nuclear waste disposal. Research in the Atikokan area is to be completed by the end of next year. At White Lake, northwest of Ottawa, similar research using boreholes drilled in 1976 will continue through 1981.

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New York State's Department of Environmental Conservation is using aerial photography to identify abandoned waste disposal sites in Monroe County, near Rochester. For details on the project of the Monroe County Environmental Management Council, contact Mary Kadlecek at (518) 457-6557.

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Congratulations to Minnesota, the first of the United States to receive EPA approval of its proposed pretreatment program. Under the 1977 Clean Waters Act, the program is aimed at curbing industrial wastes entering municipal wastewaters treatment plants and at increasing opportunities for recycling and reclamation of wastewater and sludges.

LETTERS TO THE EDITOR

Dear Ms. Bonner:

I read with interest your article on the Lambton industrial Society in the June 1979 issue of FOCUS. Some of the industries along the lower Wabash Valley in Indiana have developed an informal but very active consortium to support basic research on the river. This program is now in its seventh year and involves participation by eight industries plus frequent interaction with the State of Indiana Stream Pollution Control Board and Region V EPA personnel.

Most of the field and laboratory investigations have been conducted under contract by university scientists and a variety of consultants. Because of the magnitude and complexity of the subjects investigated, coordination and integration of the information acquired has been a major task. However, problems with information exchange have been largely alleviated by monthly meetings of all participants and an annual meeting for all interested parties. Annual reports and scientific journal papers complete the information exchange process.

The group has worked on several major projects involving both water chemistry and biological studies. A waste-load allocation model has been developed and validated in the field. Work on an ammonia-fate model with field validation is nearing completion. A comprehensive assessment of the fish community structure over 170 miles (273 km) of river has been completed with changes being assessed by annual surveys involving both electrofishing and seining. Finally certain pointsource problems have been identified in the past which led to the installation of additional waste treatment facilities and a direct assessment of the benefits derived by the investment.

If anyone has any questions regarding this program, I can be reached at (317) 462-8589.

Sincerely,

Jerry Hamelink, Ph.D.
LILLY Research Laboratories

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Dear IJC:

I recently discovered your yellow Great Lakes pamphlet in the camp headquarters of a New York State park. I almost overlooked it until I read the address.

About one month ago, I began to research the pollution of Lake Erie and found the 1969 report compiled for your Commission to be very informative. I concluded incorrectly, however, that this was your main and only purpose and

after this and other reports, namely Lake Ontario, the St. Lawrence River, and Niagara River, your commission was disbanded. I'm very glad to see that it isn't. I read only bits and pieces of the Lake Erie report and failed to follow through with my research project. But now I feel renewed energy to rejuvenate my research.

I live in a heavily industrialized city of about 100,000 people on the south shore of Lake Erie. I have lived here all of my life and at age 20, I have hopes that in my lifetime I will witness the rejuvenation of the lake. I do not believe Lake Erie to be dead nor a stagnant cesspool, two terms often used in reference to it. It disheartens me greatly to see the beach in my city restored with a new beach house and lighted boardwalk, if the local citizens cannot fully enjoy the pleasure possible from living along the lakeshore. I can say with all honesty that the majority abstain from swimming in the water and the ones who do, merely do so on the hottest of summer days. I went in the water only once this past summer and the water appears somewhat cleaner. Unfortunately, just because the water looks cleaner doesn't mean that it is chemically purer. There is less of a rotting fish smell in the air. But I know that much more still needs to be done.

I am thankful that I have travelled to various campsites along Lake Huron, Lake Michigan, and Lake Superior and have witnessed the differences among them. It was refreshing to bathe in the waters of lakes Michigan and Huron, their waters blue and clear. Seeing Lake Superior along the Upper Peninsula of Michigan was reason enough to drive over 400 miles from my home. The water - so pure and clear, the beach - clean and unspoiled. It was something I'd never witnessed but hope to again some day soon.

I think these lakes, relatively unpolluted, are our biggest challenge - to keep them that way in a world of growing technology and expanding industry. Lake Erie is a good example of what can happen. Unfortunately it has happened, but my attitude is a very positive one. From municipality to industry there must be cooperation and a willingness to clean up Lake Erie and keep unspoiled the other Great Lakes. I know little of Lake Ontario nor have I ever seen it, but its original state should not have been tampered with either. If it be polluted, let all parties involved generate new life into it.

These Great Lakes are one of the most valuable natural resources Canada and the United States have. To neglect and abuse them will only prove detrimental to ourselves.

Thank you,

David Graziano
Lorain, Ohio

And thank you, David. The Editor

FOR ADDITIONAL COPIES

Write to Patricia Bonner - Editor, Great Lakes Focus, IJC Regional Office, 100 Ouellette Avenue, Windsor, Ontario, Canada N9A 6T3.

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